

518,790

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



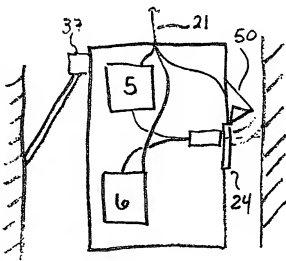
(43) International Publication Date
8 January 2004 (08.01.2004)

PCT

(10) International Publication Number
WO 2004/003506 A2

- (51) International Patent Classification: **G01N**
- (21) International Application Number: **PCT/US2003/020116**
- (22) International Filing Date: **26 June 2003 (26.06.2003)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
60/391,430 26 June 2002 (26.06.2002) US
- (71) Applicant (for all designated States except US):
WELL-DOG, INC. [US/US]; Annex Suite 113, 365 N. Ninth Street, Laramie, WY 82072 (US).
- (72) Inventors; and
(75) Inventors/Applicants (for US only): **POPE, John, M. [US/US]; 1166 North 11th Street, Laramie, WY 82072 (US). COX, Rick, L. [US/US]; 2353 Sweetwater Drive, Laramie, WY 82070 (US). VAN LIEU, Nelli, R. [US/US]; 1325 Silk Oak Drive, Fort Collins, CO 80525 (US). BUTTRY, Daniel, A. [US/US]; 1305 East Custer, Laramie, WY 82070 (US).**
- (74) Agent: **ACKERMAN, William G.; CROWELL & MORING, LLP, Intellectual Property Group, P.O. Box 14300, Washington, DC 20044-4300 (US).**
- (81) Designated States (national): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**
- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).**
- Published:
— without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guideance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **IN-SITU DETECTION AND ANALYSIS OF COAL BED METHANE FORMATIONS WITH OPTICAL INSTRUMENTS AND METHODS AND APPARATUS TO FACILITATE METHANE PRODUCTION AND ANALYSIS**



(57) Abstract: A measuring system for in-situ measurements down a well by a spectrometer is provided. The spectrometer includes a radiation source and a detector. A probe is optically connected to the spectrometer and includes an optical pathway for transmission of a radiation from the radiation source and at least a second optical pathway for transmission of a characteristic radiation from a sample to the detector. A positioner is provided to position the probe near a side surface of the borehole and to optically couple the optical pathways to the side surface, wherein the probe is traversable up and down the well by way of a guide operatively connected to the probe and to a fixed location at the wellhead. By use of the apparatus and method a concentration of methane or other substance of interest is obtained, and thereby, a potential production of a coal bed methane formation is obtained.

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